Innovations in Proteases and their Inhibitors; Edited by Francesc X. Avilés, Walter De Gruyter; Berlin, New York, 1993; x + 534 pages. $ 132.00. ISBN 3-11-013635-X

This book originates from an International Workshop on proteases and inhibitors held at Madrid, Spain in October 1991. The book contains papers presented at the Workshop as well as additional contributions, thereby expanding the number of topics covered. The 28 chapters of the book are grouped in three major sections.

The first section, Fundamental Aspects of the Actions of Proteases and their Inhibitors, contains 6 chapters in a total of 122 pages: Regulation of Protease Action (H. Neurath), Evolution of Peptidases (A.J. Barrett and N.D. Rawlings), Regulation of Pancreatic Protease Expression (A. Puigserver et al.), Plasma Membrane Endopeptidases (A.J. Kenny), Biological Control Through Proteolysis in Yeast (M. Thumm), and Structural Basis of Protease–Inhibitor Interactions (W. Bode and R. Huber).

The next section, Recent Advances in the Study of the Structure and Biologic Role of Specific Proteases and their Inhibitors, contains 15 chapters in a total of 266 pages: Thrombin Specificity Determinants (S. Stone), Structure of Monomeric Aspartate Proteases (V. Dahnaraj et al.), Lysosomal Proteases and Cystatins (V. Turk and W. Bode), Kinetics and Mechanism of Inhibition of Cysteine Proteases (W. Machleidt et al.), Aspects of Calpain Activation (T.C. Saido and K. Suzuki), Multicatalytic Protease/Proteasome (L. Kuhen et al.), Membranal Metallo-protease KSMP (R. Seger et al.), Mast Cell Proteases (K.K. Eklund and R.L. Stevens), Carboxypeptidase E/H (L.D. Fricker and L. Devi), Activation of Pancreatic Procarboxypeptidases (J. Vendrell et al.), Synthetic Inhibitors of Collagenases (V. Dive), Activation of Matrix Metalloproteases (H. Nagase and G. Salvesen), Cereal Trypsin/α-Amylase Inhibitors (P. Carbonero et al.), Proteases in Plant Development (B. San Segundo), and Squash Protease Inhibitors (J. Otlewski).

The last section, Biotechnological Applications of Proteases and Protease Inhibitors, contains 7 chapters in a total of 124 pages: Folding Pathways of BPTI (N. Darby et al.), NMR Structure Determination of Protease Inhibitors (K. Wüthrich et al.), Mutagenesis of Trypsin/Novel Properties of Proteins (D.R. Corey and C.S. Craik), Structure of Thrombin/Design of Inhibitors (W. Bode), Non-peptide Inhibitors of HIV Proteases (R. Salto et al.), Protein Engineering of Plant Protease Inhibitors (E. Querol et al.), and Proteolysis-induced pathomechanisms in inflammation (M. Jochum et al.). An appendix contains 13 selected figures presented in color.

The layout of the book is very pleasing as the editor has succeeded in obtaining most manuscripts in a fairly uniform format, nearly free from typing errors. The authors selected are leading experts in their fields, and most of the contributions are very readable and timely accounts of the rapidly developing field of proteases and protease inhibitors. In contrast with many Conference Proceedings there is minimal overlap between the contributions in the present book.

The selection of topics could have been better, since there are several important topics that are not adequately covered or not covered at all. For example, Serpins could have received a broader coverage, and Bikunin-type inhibitors and inhibitors of the α_2-macroglobulin-type are not covered. Further, evolutionary aspects of protease inhibitors could have been treated in greater detail, and the sofisticated regulatory plasma proteases and the eucaryotic subtilisin-type processing proteases are not dealt with.

In summary, the editor has succeeded in organising a selection of papers, which despite some omissions gives a timely account of a rapidly expanding and very diverse field. The book is welcome in partially filling a gap in the review literature on proteases and inhibitors. The book will be very useful not only for investigators within this field but also for others, especially students, who want to get an impression of its present state and facile access to key contributions.

Lars Sottrup-Jensen

Regulation of Cellular Signal Transduction Pathways by Desensitization and Amplification; Edited by D.R. Sibley and M.D. Houslay, John Wiley and Sons; Chichester, New York, Brisbane, Toronto, Singapore, 1994. xi + 368 pp. $ 65.00. ISBN 0-471-94154-9

This is the third volume in a Wiley series on molecular pharmacology of cell regulation. Each of the previous volumes focused on a single type of enzyme of the cellular signal transduction pathway: G-proteins and cyclic nucleotide phosphodiesterase. This new title is ambitious and puzzling: 'Regulation... by desensitization and amplification' could suggest that desensitization and amplification concur sequentially to regulating cellular responses. The two phenomena occur indeed on different time scales, amplification (an ill-defined concept) is a prerequisite for the generation of a response that will be eventually regulated by desensitisation. But pharmacologists are more interested, and know more about desensitisation phenomena than about amplification mechanisms.

The first part presents two widely different sensory transduction systems: bacterial chemotaxis and vertebrate visual transduction. J. Stock starts with the peremptorous claim that bacterial chemotactis 'is better understood that any analogous sensory system in any organism and cell type', he developps a detailed genetic analysis of the main response regulator of the flagellar motor, discuss the regulation of kinase activity and the role of methylation and concludes too modestly that this wonderful machinery is only 'beginning to be understood at a molecular level'. The vertebrate visual transduction cascade is also discussed in great details (Hargrave and Hamm), particularly as concerns regulations of the Receptor-G-protein coupling, by rhodopsin kinase and arrestin; but for the regulations of transducin-phosphodiesterase coupling and PDE activation, as well as for calcium-dependent guanylate cyclase inactivation by recoverin, part of the discussions may already be outdated. Progress in the analysis of this fascinating system have recently been so fast (and sometimes so erratic!) that a one year old text may look partially obsolete.

Regulations of the G-protein-mediated transductions systems constitutes by far the main part. At the receptor level, phosphorylation is the key mechanism: agonist-dependent, direct and rapid, by receptor-specific kinase, or indirect, slower but more amplified, by the PKC pathway. An effort is made in the first contribution (Ligett and Lefkowitz) to try to interpret and classify in the adrenergic-Gs-cyclase system, the multiple consequences of phosphorylation in terms 'uncoupling', 'sequestration' and 'down regulation' of the receptors. Genetic regulations of adrenergic receptors is discussed at length, but in an independent contribution. Other systems are introduced later: muscarinic, PIC-coupled and adenosine receptors. Each system is individually well discussed, but a general synthesis would have been helpful. From the next chapters (part 3) I learnt that receptor-mediated down regulation of G-protein levels was well documented, but I did not get clearer ideas on the role of receptor or G-protein phosphorylation in this process.

The contributions titles in part 4, 'Regulation of Insulin and EGF receptors function by phosphorylation' are misleading for discussing mostly tyrosine phosphorylations that take part to the transduction

process themselves. It's a different problem, very interesting in itself, but the regulation of these receptors by serin threonin phosphorylation is only a minor issue in these two contributions which, in an edited book, could have been more coordinated.

In the final chapters of ionic channels, phosphorylation reappears as a major regulatory process. A more coordinated presentation or a comparison of the different channels would again have been very useful.

On the theme 'Regulation of cellular signal transduction pathway by phosphorylation', much useful information – which may probably be found scattered elsewhere – is put side by side in this book. The editors clearly made the effort of coordinating the theme and the titles of the contributions, could they have also better coordinated their content?

Marc Chabre

PCR; by C.R. Newton and A. Graham, BIOS Scientific Publishers Limited, 1994; xii + 161 pages. $ 16.00/$ 30.00 (pbk). ISBN 1 872748 82 1

The book provides an overview of the properties of PCR and some of its applications. Some of the chapters of the book contain very basic information, such as a detailed description of the chemical structure of DNA. These parts of the book should be useful for persons with no previous experience of DNA techniques. Other chapters again, like the one describing the complicated issue of quantitative PCR analysis, are too brief and require previous knowledge of DNA techniques to be comprehensive. Because the level of difficulty and amount of detail given varies highly from chapter to chapter it is somewhat unclear who the potential readers of the book should be.

The book is divided into two parts; Part I describes the principles of PCR in three chapters, and Part II reviews modifications and applications of PCR in 13 very brief chapters. Especially Part I of the book, which comprises about one fourth of the text, should be useful reading for PCR-beginners. The second chapter is in my opinion the most informative part of the book. The chapter provides an extensive summary of available PCR instruments, reagents and consumables, which may be valuable also for scientist already familiar with PCR-based methods. The chapter also gives some good advice for setting up PCR reactions in practice. In this chapter, as in some of the later chapters, the authors creditably explain the effects of the PCR components and reactions conditions on each of the steps of the amplification process. These explanations will help the reader to understand the PCR process and hence the use of PCR as a 'black box' for making DNA can be avoided.

The seven first chapters of Part II describe the use of PCR as a tool for genetic engineering. Most of the PCR-based methods that have been developed for cloning, modification and sequence determination of DNA fragments are mentioned. The chapters give the reader a general idea about the many possibilities of PCR and the numerous figures included in each section clarify the principle of the methods. The text is, however, very concise and without previous knowledge or further reading it may be difficult to understand or to use the methods in practice.

In the latter half of Part II of the book, which deals with applications of PCR, the problem of trying to include too much in too little space becomes evident. Several of the chapters are superficial and uninformative. To describe the human genome mapping applications of PCR in four pages, or the PCR-based detection of clinically important bacteria in a single page are impossible tasks. More references to original work would have increased the informativity of these chapters, as well as of most of the other chapters of the book. In part of the chapters the content is illogical in relation to the title. For example the chapter on fingerprinting contains a section on HLA-typing. Instead this chapter could have been entitled genotyping, and a section about forensic analyses, a field which has been benefitted largely from PCR-based methods could have been included here. The chapter on characterizing unknown mutations is appropriate, it explains clearly the principles of the three most important methods used for this purpose. However, the content of the chapter of analysis of known mutations is biased in favour of the ARMS-assay that the authors of the book have been involved in developing, while other promising methods for detecting known mutations are not mentioned even in the section on infrequently used other methods.

The glossary of basic terms, the list of suppliers of PCR reagents and equipment, and the list of other books on PCR given as appendices can be useful for the readers of the book, while the list of PCR-related patents in the last appendix is incomplete and seems unnecessary.

To cover all aspects of PCR in a book of 160 pages is a heroic effort. In my opinion the authors have been only partially successful in this effort. In the best parts of the book the properties of PCR and the principles of the methods used to analyze PCR products are well explained. The main limitation of the book is the deficient description of the wide applications of PCR.

Ann-Christine Syvänen